The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GIUSEPPE FERLA and FERRUCCIO FRISINA

Appeal No. 1999-2578
Application No. 08/811,363

ON BRIEF

Before KRASS, JERRY SMITH and LALL, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 19-34.

The invention is directed to a high density power device. More particularly, a process is disclosed which is said to allow higher scales of integration in power MOSFETS. The process for manufacturing such power MOSFETS includes an implantation mask for the source regions which coincides with the implantation mask

for the channel regions and for the deep body regions of elementary functional units. This is made possible by implanting dopant along directions tilted at angles ranging from 0 to 60 degrees with respect to a direction orthogonal to the surface of the material wherein the dopant is to be implanted. Consequently, the tolerance on the dimension of the source regions is not determined by the mask alignment rules, but substantially by the tolerance of thicknesses of three layers (gate oxide, polysilicon oxide, insulating oxide), which is at least one order of magnitude lower. Therefore, the dimension of the source region is more finely controlled and narrower elementary functional units can be formed.

Representative independent claim 19 is reproduced as follows:

> 19. A high-density MOS-technology power device integrated structure comprising a plurality of elementary functional units formed in a semiconductor material layer of a first conductivity type covered by a conductive insulated gate layer sandwiched between two insulating layers, wherein each elementary functional unit comprises:
>
> an elongated window formed in said insulated gate layer and in said two insulating layers, having two elongated edges and two short edges, said edges being sealed by insulating material sidewall spacers;
>
> a heavily doped elongated deep body region of a second conductivity type formed in the semiconductor material layer and substantially aligned with the edges of the window;
>
> two elongated channel regions of the second conductivity type formed in said semiconductor material layer and extending along the elongated edges of said window; and
>
> two elongated source regions of the first conductivity type formed in

the deep body region along said elongated edges of the window so as not to extend under the insulated gate layer.

The examiner relies on the following reference:

Korman et al. [Korman] 5,119.153 Jun 02, 1992

Claims 19-34 stand rejected under 35 U.S.C. § 112, first paragraph, as relying on an inadequate written description. In particular, the examiner contends that there is no written description, i.e. no support in the originally filed disclosure, for "so as not to extend under the insulated gate layer" in claim 19, and for "not under the gate electrode structure" in claim 28.

Claims 19-34 stand further rejected under 35 U.S.C. § 103 as unpatentable over Korman.

Reference is made to the brief and the answer for the respective positions of appellants and the examiner.

OPINION

In accordance with appellants' grouping of the claims, at page 7 of the brief, all claims will stand or fall together.

We turn our attention first to the rejection of all the claims under 35 U.S.C. § 112, first paragraph. It is the examiner's position that in accordance with instant Figure 5 and page 8 of the specification, source regions are formed by dopants

implanted at an angle of 60 degrees. The examiner contends that at this angle, "it appears that source regions are extended below the gate layer although the drawings do not clearly show the extended portion under the gate layer. Note that the specification is completely silent whether the source region is extended under the gate layer or not" [answer-page 4].

Within the confines of the written description requirement of 35 U.S.C. § 112, all that must be shown is that an applicant had possession of the claimed subject matter at the time of originally filing the patent application. Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563, 1564, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991).

It is clear to us, from original pages 8-9 and Figures 5-8 of the instant disclosure, that there are implantations at four different angles, A1-A4, with the implantation angles A1 and A2 directed to implantation of N-type dopants which are **not** meant to penetrate under the gate layer, and implantation angles A3 and A4 directed to implantation of dopants which **are** meant to penetrate under edges 17 of windows 15. These are two different processes meant to achieve different results, but as far as the instant independent claims are concerned, there is clear support for the recitations of source regions formed "so as not to extend under the insulated gate layer" (claim 19) or formed "not under the gate electrode structure" (claim 28). We agree with appellants' explanation at page 8 of the brief and we adopt such explanation as our own in reversing the rejection of claims 19-34 under 35 U.S.C. § 112, first paragraph.

We turn, now, to the rejection of claims 19-34 under 35 U.S.C. § 103 as unpatentable over Korman.

At the outset, we note that while the statement of rejection relies only on the Korman reference, the examiner appears to rely, at least in part, on U.S. Patent No. 5,606,191 to Wang. See the examiner's reference to Figure 15 of Wang, at page 6 of the answer, in responding to appellants' arguments. We will not consider the Wang reference since there would appear to be no excuse for not including Wang in the statement of rejection if the examiner intended to rely on this reference as a basis for the rejection. In re Hoch, 428 F.2d 1341, 1342, 166 USPQ 406, 407 (CCPA 1970).

The examiner's position is that Korman discloses a power MOSFET (Figure 1) having a conductive insulated gate layer 132, an elongated window having two elongated edges and two short edges, side wall spacers 142, heavily doped elongated deep body regions 119, two elongated channel regions under the gate layer and two elongated source regions 120. The examiner baldly concludes therefrom, that it "would have been obvious that Korman teaches the claimed device" [answer-page 5].

Interestingly enough, the examiner points to no difference between the disclosure of Korman and the instant claimed subject matter. While an anticipatory reference is also proper under 35 U.S.C. § 103, as anticipation is the epitome of

obviousness, one wonders why the examiner did not apply the rejection, based on 35 U.S.C. § 102 if the examiner truly believes that there are no differences between the instant claimed subject matter and that disclosed by Korman.

Unfortunately, in the answer, the examiner never comes to grips with the specific claimed limitations relating to the source regions formed "so as not to extend under the insulated gate layer" (claim 19) and formed "not under the gate electrode structure" (claim 28). Clearly, in Korman, source regions 120 (Figure 1) do extend under the insulated gate electrode 131. The source regions in Korman do not appear to be aligned as in the instant claimed invention and the examiner has pointed to nothing in Korman to suggest that the artisan would have been led to align the source regions with the gate electrode structure.

The reason the examiner ignores the claim limitations relating to the source region being "not under the gate electrode structure" may be because, in the examiner's view, there is no support for these limitations. We note the statement of the examiner's rationale for the rejection, at page 4 of the answer: the claims are rejected "insofar as understood." If the claims were not fully understood, the examiner should have considered a rejection based on the second paragraph of 35 U.S.C. § 112. But if a prior art rejection is to be applied to the claims, that rejection should address each and every claim limitation, ignoring no limitation because it is not understood or because there is allegedly no support for it.

We will not sustain the rejection of claims 19-34 under 35 U.S.C. § 103 since the examiner has not addressed each and every claim limitation and, hence, has failed to establish a prima facie case of obviousness with regard to the instant claimed subject matter.

We have not sustained the rejection of claims 19-34 under either 35 U.S.C. § 112, first paragraph, or 35 U.S.C. § 103.

Accordingly, the examiner's decision is reversed.

REVERSED

ERROL A. KRASS Administrative Patent Judge	)
JERRY SMITH Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
PARSHOTAM S. LALL Administrative Patent Judge	)

eak/vsh

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